

# Energy Infrastructure and Markets Database: Global Gas Storage Module

Critical storage information to gas supply and  
asset management strategies in a dynamic,  
global energy market



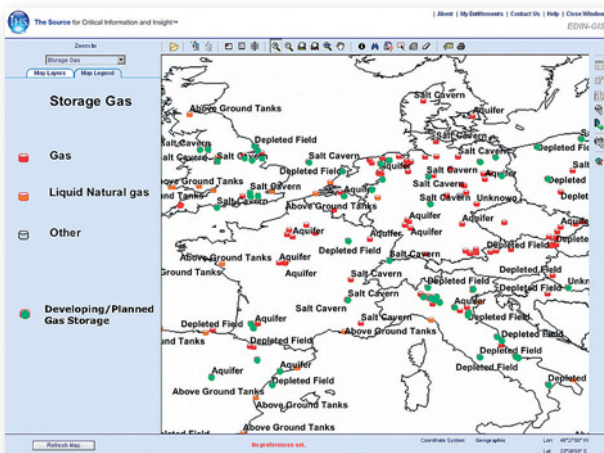
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As gas market stakeholders face uncertainty regarding the gas supply outlook as well as the impact of high prices and economic volatility on demand growth, gas storage has become a critical link in gas chain asset management. The trend toward gas market globalisation with the expanded role of LNG also has extended the geographic sphere of influence of many storage facilities and thus their economic value. Gas storage in one region of the world can be virtually tapped to accommodate demand fluctuations in another part of the globe as seen subsequent to the Japanese nuclear plant outage in 2007.

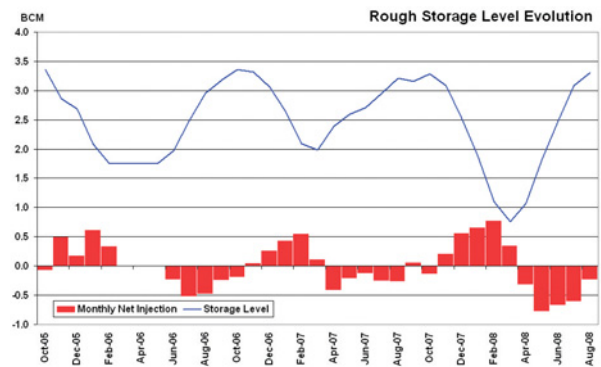
During off peak demand periods in the Northern Hemisphere, LNG shipments can be diverted to regions with more than adequate underground storage capacity to meet regional needs such as the United States Gulf Coast. In subsequent peak demand periods or as a result of events which amplify gas demand in another part of the world, LNG shipments can be directed to the markets which netback the highest price. Gas stored in the underground facilities during the off peak period would then be tapped to meet demand requirements locally or in regions accessible by pipeline.

Historically, gas storage's primary role has been to accommodate seasonal demand swings in regional markets. Although domestic producers often have been relied upon to vary production to accommodate demand fluctuations, increased reliance on pipeline gas imports has reduced internal flexibility in regions such as Europe, thus increasing local storage requirements.



Gas storage capacity and projects in Europe

Geopolitical events have amplified supply security concerns related to gas imports and have provided additional impetus



Monthly net injection / withdrawal levels for the Rough storage facility in the United Kingdom

to gas storage investment. The objective of the European Union to develop an integrated gas market with viable, liquid gas hubs also supports storage capacity increases in the region.

Demand insecurity is another pressing issue that supply planners must address. With high energy prices and economic volatility, gas demand growth is uncertain and intertwined with fuel decisions related to carbon emissions reduction mandates. Growth potential and seasonal profiles vary considerably by region, impacting the supply flexibility needed.

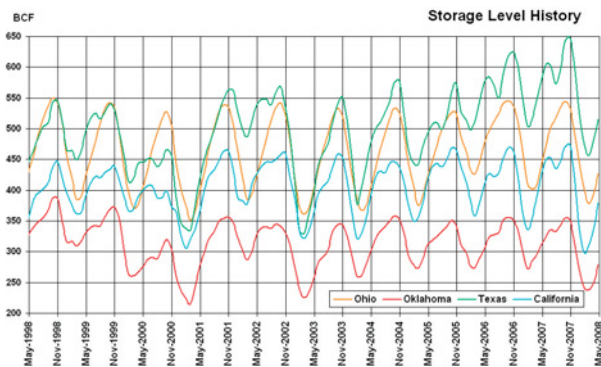
Climate change also impacts seasonal consumption profiles. Gas storage provides the increased flexibility needed by industry stakeholders to enhance supply reliability, accommodate demand fluctuations and maximise the value of assets all along the gas and power chain.

With the enhanced role of storage in the dynamic global gas market, IHS has expanded the gas storage data content in its Energy Infrastructure and Markets suite of database products and offers the Global Gas Storage Module.

The IHS Global Gas Storage Module provides key information needed to support business decisions regarding:

- What is the storage capacity and type of facility in a specified region of interest? What are the daily limits on injection and withdrawal rates? Who is the operator and what is the ownership structure?
- Do gas quality specifications vary by region?
- Where is gas storage being added and what type? What are the current status, expected online date and sponsors of the projects?
- How have storage levels, injections and withdrawal rates varied by region and operator?
- Where are the opportunities to arbitrage most likely to develop?





Comparison of variations in monthly storage levels for key US states

## Global Gas Storage Module Data Content Summary

### Gas Storage Facility Basic Data

- Facility name
- Location (geographical coordinates)
- Owner /operating company
- Operating status
- Online date
- Storage Type (Aquifers, Depleted Fields)
- Technical information (number of wells, tanks, compressors)
- Gas Loses
- Number of cycles per year
- Installed compressor power MW
- Maximum and minimum line pressure
- Maximum consecutive time of injection or withdrawal
- Time to switch from one status to another (idle, injection, withdrawal)
- Number of storage wells

### Gas Storage Capacity Data

- Maximum working gas volume
- Total cushion gas volume
- Total gas volume
- Injection (min, max, reserved)
- Withdrawal (min, max, reserved)
- Volume correction factors
- Daily correction factors

### Gas Storage Levels

- Injection (absolute, relative)
- Withdrawal (absolute, relative)
- Net withdrawal
- Storage level (absolute, relative)
- GCV measured (injected, withdrawn)

### Storage Gas Specification

- Historical data
- GCV (min max)

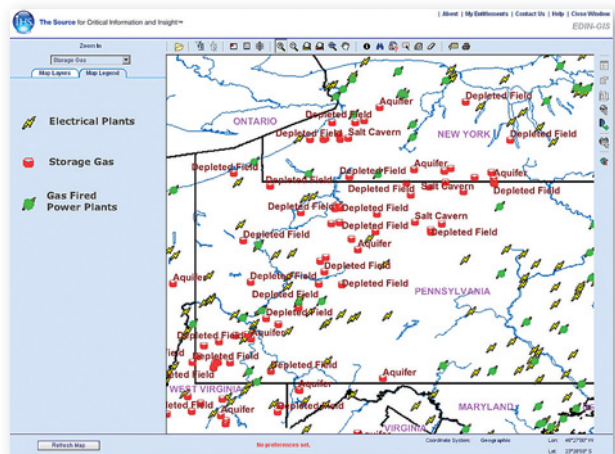
- Wobbe (min max)
- Max HC and H2O dew points
- Max and min concentration by elements (N2, S2, CO2, CH4, Mercaptans, etc)

### Gas Storage Tariffs

- Historical data
- Currency
- Tariff
- Service (injection, withdrawal, storage)
- Term (short term, long term)
- Priority (Firm, interruptible)
- Period (peak, base)

### Gas Storage Contracts

- Historical data
- Currency
- Price
- Provider
- Client
- Volume
- Service
- Term
- Priority
- Period



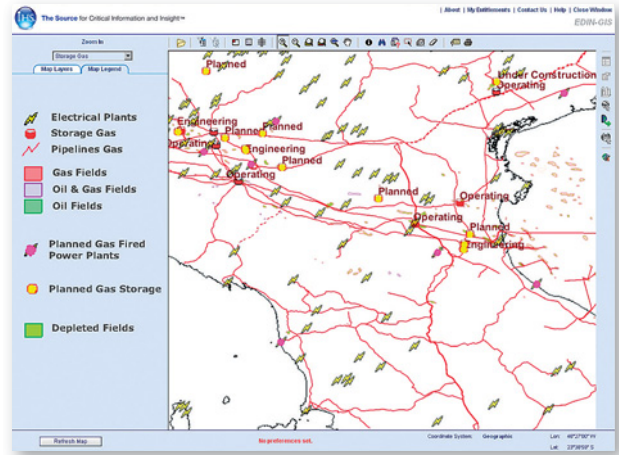
Gas storage capacity by type in the US Northeast

With the IHS GIS tools, you can query and map storage facilities meeting specified criteria. The module can be seamlessly integrated with the IHS Midstream Essentials, European Gas & Power, Global Emissions and E&P Essentials databases, allowing users to track gas field and infrastructure developments all along the gas chain from the wellhead to power plant and industrial customers. New projects as well as existing facilities are captured.

The integrated database provides key information needed to support:

- Market analysis – What are the plans for new gas fired power plants? How are the markets positioned with respect to existing and future supply sources? How does this compare with the storage capacity needed to accommodate seasonal consumption profiles for the regions?
- Supply planning – Where are the new fields located? What is the current development status? What is the status of the pipeline or LNG infrastructure to deliver the gas to the market?
- Investment decisions – Based on new electric power plant projects and new supply and associated infrastructure developments, where are the best locations for new gas storage facilities?
- Environmental sustainability – Which facilities are struggling to comply with their greenhouse gas emissions allocations? What is the potential for competition with carbon capture and storage for new gas storage sites?
- Competitor analysis – A company’s portfolio can be identified all along the gas and power chain. Based on the gas field, pipeline, storage and power generation assets, who would be a good strategic partner or acquisition candidate?

There are a number of large scale pipeline and LNG liquefaction projects in various stages of development. Depending upon their actual execution, there is considerable potential for “famine and feast” gas supply cycles developing. Gas storage will be a critical component in a company’s strategy to manage its gas assets during these cycles.



Storage potential of depleted fields in northern Italy displayed with the gas supply infrastructure

Modules available in the Energy Infrastructure and Markets Database suite of products include:

**Midstream Essentials** – Oil and gas chain transportation, processing and market infrastructure worldwide

**European Gas & Power** – Electric power plants by unit, gas markets and gas supply infrastructure in Europe

**Global Emissions** – CO2 emissions by individual power plant and major industrial facilities along with Clean Development Mechanism (CDM) and Joint Implementation (JI) projects

**E&P Essentials** – Oil and gas fields, associated reserves and development status

All infrastructure data is mappable and accessible through IHS GIS products.



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